

ABSTRACT OF THE DISCLOSURE

Disclosed is a downlink signal configuring method and device, and synchronization and cell search method and device using the same in a mobile communication system. A downlink frame has plural symbols into which pilot subcarriers are distributively arranged with respect to time and frequency axes. Initial symbol synchronization and initial frequency synchronization are estimated by using a position at which autocorrelation of a cyclic prefix of a downlink signal and a valid symbol of the downlink is maximized, and cell search and integer-times frequency synchronization are estimated by using pilot subcarriers included in the estimated symbol. Fine symbol synchronization, fine frequency synchronization, and downlink frame synchronization is estimated by using an estimated cell search result. Downlink frequency and time tracking is performed, cell tracking is performed by using a position set of pilot subcarriers inserted into the downlink frame, fine symbol synchronization tracking and fine frequency synchronization tracking are repeated by using the pilot subcarriers to perform the frequency and time tracking of the downlink frame.